Cisco 7600 Series Ethernet Services Plus 20 and 40-Gbps Line Cards

The Cisco® 7600 Series Ethernet Services Plus 40-Gbps (ES+40) line cards use an extensible design that allows service prioritization for voice, video, data, and wireless mobility services. Service providers and enterprises can benefit from the improved economics, density, advanced Carrier Ethernet features, and high performance of the ES+40 fixed-configuration line cards. With the same architecture and features, the Cisco 7600 Series Ethernet Services Plus 20-Gbps (ES+20) line cards are designed for networks with lower interface density requirements. In the following sections, the ES+40 and ES+20 line cards are referred to as the ES Plus cards.

The Cisco 7600 ES Plus cards' programmable interface processors protect network investments and reduce total cost of ownership. The design increases connectivity options and offers superior service intelligence through programmable interface processors operating at line rate. This data sheet contains the specifications for the Cisco 7600 ES Plus line cards (Figure 1) as supported on the Cisco 7600 Series Routers. The ES+40 and ES+20 linecards are also supported on Cisco Catalyst 6500 Series switches. For more information on this support, please visit: <URL>

Figure 1. Cisco 7600 ES Plus line cards: 4-Port 10 Gigabit Ethernet and 40-Port Gigabit Ethernet; 2-Port 10 Gigabit Ethernet and 20-Port Gigabit Ethernet

ES+ Series 4-Port 10GE Line Cards
ES+ Series 40-Port 10GE Line Cards
ES+ Series 2-Port 10GE Line Cards
ES+ Series 20-Port 10GE Line Cards

Product Overview

Designed for Carrier Ethernet, IP/Multiprotocol Label Switching Provider Edge (IP/MPLS PE), mobile wireless backhaul, and enterprise WAN/MAN applications, the Cisco 7600 Series Ethernet Services Plus 40-Gbps line cards (ES+40) support up to 40 Gbps of bandwidth with 40 ports of Gigabit Ethernet or 4 ports of 10 Gigabit Ethernet interfaces. With the same architecture and features, the Cisco 7600 Series Ethernet Services Plus 20-Gbps line cards (ES+20) offer 20 Gbps of bandwidth with 20 ports of Gigabit Ethernet or 2 ports of 10 Gigabit Ethernet interfaces. The cards feature hierarchical quality of service (QoS), locally significant VLANs, distributed MAC learning, and up to 16,000 Ethernet service instances per line card for rich services. The Cisco 7600 ES Plus line cards provide the unique ability to combine both Layer 2 and Layer 3 services on the same line card. The combination of native Ethernet Layer 2 switching, bridging, Virtual Private LAN Services (VPLS), Ethernet over MPLS (EoMPLS), and Layer 3 IP/MPLS routing distinguishes this line card among other products on the market, particularly in Carrier Ethernet applications.

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The ES Plus line cards also include synchronization circuitry enabling them to provide standards-based functions for delivering and deriving transport-class network timing, enabling support of network-synchronized services and applications such as mobile backhaul and time-division multiplexing (TDM) migration.

Recognizing that real-time media dominate next-generation services, Cisco has integrated video monitoring technology into the ES Plus line cards. This multimedia technology enables real-time monitoring and statistics collection for video flows, enabling proactive maintenance and management of today's media-rich services - without the use of additional service modules or external probes. To see a video demonstration of inline video monitoring from Cisco in action, visit http://www.cisco.com/web/solutions/routingswitching/vidmon.html.

The innovative architecture of these industry-leading, premium line cards is designed to deliver cost-effective, high-touch features, combining both application-specific integrated circuit (ASIC) and network processor technologies for an optimal combination of performance and flexibility. The Cisco 7600 ES Plus line cards provide distributed forwarding with proven ASIC technology in the forwarding path (routing, switching, NetFlow, and access control lists [ACLs]), as well as for queuing and shaping functions to provide the maximum performance for these foundational features. Additionally, four (for the ES+40 line cards) or two (for the ES+20 line cards) programmable network processors are included in the forwarding plane to facilitate flexibility and feature growth. This ideal technology combination offers customers the necessary flexibility for future service deployments and allows them to scale the system capacity as required.

Key Features and Benefits

Table 1 lists the features and benefits of the ES Plus line cards.

Table 1. Features and Benefits of ES Plus line cards

Feature	ES Plus Line Card	Benefit
Line-card form factor	4-port 10 GE or 40-port GE and 2-port 10 GE or 20-port GE	Offers economical, high-density, high-performance, premium Carrier Ethernet services with excellent scalability
Performance	Line rate with services enabled	Provides line-rate forwarding performance on GE and 10 GE interfaces with services enabled
Packet memory	512 MB	Up to 200 ms combined bidirectional buffering (100 ms ingress and 100 ms egress) at 10 Gbps
Switch-fabric connectivity	Two 20-Gbps fabric channels	Uses the Cisco 7600 Series 720-Gbps switch fabric for data forwarding; two fabric channels are used
Online insertion and removal (OIR)	Supports OIR of the line cards	Provides hitless OIR to minimize effect of add, change, and remove operations

Product Specifications

Table 2 gives specifications of the ES Plus line cards, and Table 3 lists features supported.

Table 2. Product Specifications

Description	Specification
Chassis compatibility	Cisco 7603-S Cisco 7604 Cisco 7606 and Cisco 7606-S Cisco 7609 and Cisco 7609-S Cisco 7613 For Cisco Catalyst 6500 support, please visit: <URL>
Central-forwarding-engine compatibility	The line cards are compatible with the Cisco 7600 Series Supervisor Engine 720-3B/3BXL and Cisco 7600 Series Route Switch Processor 720 (RSP720) and later. The ES Plus line cards require dual-channel switch-fabric connectivity; therefore, these line cards are not supported with the Cisco 7600 Series Supervisor Engine 32 or in slots 1 through 8 of the Cisco 7613 chassis.

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Description	Specification
Distributed Forwarding Card (DFC)	Choice of Cisco Distributed Forwarding Card 3C or 3CXL (DFC-3C or DFC-3CXL, respectively) Line-rate distributed forwarding with services enabled; up to ~48 mpps per line card Distributed Forwarding Card 3C (DFC-3C): Designed for Carrier Ethernet-based infrastructures Allows up to 256,000 hardware-based forwarding entries Allows up to 128,000 NetFlow entries Distributed Forwarding Card 3CXL (DFC-3CXL): Optimized for IP/MPLS PE offering multiple IP services such as Layer 3 VPNs, IPv6, and triple- or quadruple-play services (data, voice, and video or data, voice, video, and mobility, respectively) Up to 1 million hardware-based forwarding entries Up to 256,000 NetFlow entries
Minimum software	Cisco IOS® Software Release 12.2(33)SRD or later
Packet memory	512 MB for 200 ms of combined input and output buffering at 10 Gbps (100 ms ingress and 100 ms egress)
Link encapsulations	Ethernet II and IEEE 802.1q encapsulations
Hardware queues	ES+40 line cards: • 128,000 ingress queues • 128,000 egress queues ES+20 line cards: • 64,000 ingress queues • 64,000 egress queues • Hierarchical QoS (H-QoS)
MAC addresses	Up to 96,000 MAC addresses per ES Plus line card Hardware-based MAC learning at wire rate
Environmental conditions	Operating temperature: 32 to 104°F (0 to 40°C) Storage temperature: -40 to 167°F (-40 to 75°C) Relative humidity: 10 to 90 percent, noncondensing Operating altitude: -60 to 2000m
MIBs	Cisco Entity MIB (CISCO-ENTITY-MIB) Cisco Entity Asset MIB Cisco Entity Field-Replaceable Unit (FRU) Control MIB Cisco Entity Alarm MIB Interface IF MIB (RFC 2233) Definitions of Managed Objects for Bridges (RFC 1493) Evolution of Interfaces Group of MIB-II (RFC 1573) Simple Network Management Protocol (SNMP) MIB II (RFC 1213) Remote Monitoring (RMON) MIB (RFC 1757) Switch Monitoring (SMON) MIB Video Monitoring MIBs: • CISCO-FLOW-MONITOR-TC-MIB, CISCO-FLOW-MONITOR-MIB • CISCO-MDI-METRICS-MIB, CISCO-IP-CBR-METRICS-MIB For more details about these MIBs, visit: http://www.cisco.com/univercd/cc/td/doc/product/core/cis7600/7600mibs/
Network management	CiscoWorks, CiscoView, CiscoWorks Resource Manager Essentials (RME), Cisco ANA, Cisco VAMS
Physical specifications	Occupies 1 slot in a Cisco 7600 Series Router Up to eight ES Plus line cards in a Cisco 7609 or Cisco 7609-S 9-slot chassis Requires Supervisor Engine 720-3B/3BXL or Route Switch Processor 720 or later Dimensions (H x W x D): 1.75 x 15.375 x 16 in. Weight: • 2-port 10 GE line card (7600-ES+2TG): 11.5 lb • 4-port 10 GE line card (7600-ES+4TG): 12.4 lb • 20-port GE line card (7600-ES+20G): 11.7 lb • 40-port GE line card (7600-ES+40G): 12.9 lb

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Description	Specification
Maximum power consumption (watts)	20-port line card with Distributed Forwarding Card 3C (7600-ES+20G3C): 277 20-port line card with Distributed Forwarding Card 3CXL (7600-ES+20G3CXL): 305 2-port line card with Distributed Forwarding Card 3C (7600-ES+2TG3C): 269 2-port line card with Distributed Forwarding Card 3CXL (7600-ES+2TG3CXL): 297 40-port line card with Distributed Forwarding Card 3C (7600-ES+40G3C): 391 40-port line card with Distributed Forwarding Card 3CXL (7600-ES+40G3CXL): 419 4-port line card with Distributed Forwarding Card 3C (7600-ES+4TG3C): 371 4-port line card with Distributed Forwarding Card 3CXL (7600-ES+4TG3CXL): 399
Indicators	Status: green (operational); red (faulty)
Regulatory compliance	CE Marking
Safety	UL 60950 CSA C22.2 No. 60950 EN60950 TS001 IEC 60950 AS/NZS3260
Electromagnetic compatibility	FCC Part 15 Class A ICES-003 Class A VCCI Class A EN55022 Class A CISPR22 Class A AS/NZS3548 Class A EN61000-3-2 EN61000-3-3 EN61000-3-1 EN55024 EN50082-1 EN300 386 AS/NZS CISPR 22 Class A EN61000-6-1
Telecommunications standards	ITU-T G.691 ITU-T G.707 ITU-T G.783 Sections 9-10 ITU-T G.784 ITU-T G.803 ITU-T G.813 ITU-T G.825 ITU-T G.826 ITU-T G.841 ITU-T G.957 Table 3 ITU-T G.958FCC Part 15 Class A

Table 3. Feature Support

Description	Specification
Carrier Ethernet and IP/MPLS network protocols	IPv4 unicast and multicast IPv6 unicast and multicast Layer 2 multicast MPLS Provider Edge Layer 2 and Layer 3 VPNs MPLS Traffic Engineering (MPLS-TE) MPLS Fast Reroute (FRR) Differentiated Services (Diff-Serv) aware MPLS TE Layer 2 Tunneling Protocol Version 3 (L2TPv3) Generic Routing Encapsulation (GRE) and IP-in-IP Tunneling Ethernet Bridging and Ethernet Multipoint Bridging (E-MPB) Ethernet switching Ethernet over MPLS (EoMPLS)

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Description	Specification
Carrier Ethernet and IP/MPLS network protocols (continued)	Switch port - access and trunk QinQ termination Selective QinQ Flexible QinQ VLAN translation Private VLAN VPLS and H-VPLS VLAN and Spanning Tree Protocols Per VLAN Spanning Tree (PVST) Virtual Switch Tagging (VST) Rapid Spanning Tree Protocol (RSTP) Multiple Spanning Tree (MST) Protocol: IEEE 802.1s VLAN ACL (VACL) VLAN Trunking Protocol (VTP) Resilient Ethernet Protocol (REP) Ethernet Operations, Administration, and Maintenance (E-OAM), Connection Fault Management (CFM), and Y.1731 802.1ah
QoS	Modular QoS CLI (MQC) Policing granularity down to 64 kbps and supported on both ingress and egress Access control lists (ACL) Classification, marking, policing, and queuing Differentiated services code point (DSCP) Complex re-marking of Ethernet and IP/MPLS headers
Congestion avoidance	Weighted Random Early Detection (WRED) based on IP Precedence and DSCP
Queuing and shaping	Enhanced Class-based Weighted Fair Queuing (CBWFQ) Egress Low Latency Queuing (LLQ) Ingress and egress shaping
Traffic classification and bandwidth policing	Classification based on: • Extended ACL • IP Precedence and IP DSCP • MPLS Experimental Bits (EXP) • VLAN • Input VLAN • Class of service (CoS): Inner and outer • Policer: One rate two color and two rate three color on both ingress and egress
ACLs and security	Up to 32,000 access-list entries with no forwarding degradation Hardware counters for ACL hits
Layer 2 and Layer 3 VPNs	Layer 2 VPNs EoMPLS VPLS H-VPLS (MPLS Edge or QinQ Edge) Flexible QinQ Layer 3 VPNs MPLS VPN (RFC 2547-bis) Inter-AS and Carrier-Supporting-Carrier Multicast VPN (mVPN) mLDP based Multicast VPN (mVPN) Multicast VPN Extranet 802.1ah
Protection and bundling	MPLS FRR IEEE 802.3ad and Cisco EtherChannel technology

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Table 4. Inline Video Monitoring Feature Support

Description	Specification
Summary	Supported on all ES+ linecards Supported with supervisor engines Sup720 and RSP720 (1 gigabits and 10 gigabits) Monitoring on both ingress and egress interfaces IP/UDP encapsulated unicast and multicast video streams VBR and CBR video streams Compressed and uncompressed video streams
Metrics	RFC4445 Media Delivery Index (MDI) consisting of Delay Factor (DF), and Media Loss Rate (MLR), plus Media Discontinuity Count (MDC) - for MPEG video within M2TS (SPTS/MPTS) Delay Factor and Media Rate Variation (MRV) MDI:DF, MDI:MLR, MDI:MDC, IP-CBR:DF, and IP-CBR:MRV metrics are supported for CBR flows MDI:MLR and MDI:MDC are supported for VBR flows
Performance	Flow rates up to 10Gbps and a total of up to 40Gbps per linecard Up to 8000 flows per chassis and 1000 flows per linecard
Management	Media Stop Events (MSE) Threshold Crossing Alerts (TCA) Syslog support SNMP MIBs Full integration with Cisco's Video Assurance Management Solution (VAMS) http://www.cisco.com/en/US/products/ps9518/index.html

Licensing Information

Cisco 7600 ES Plus Basic IP License

The Cisco 7600 ES Plus line cards have two feature license options, with the following part numbers: 76-ES+BASIC-LIC (Basic license, including IPv6) and 76-ES+ADVIP-LIC (Advanced IP license).

The Basic license entitles you to use the Cisco IOS Software Release 12.2SR or Release 15S functions on the ES Plus line cards with the following exceptions:

- Multicast VPN (MVPN)
- Layer 3 IP/MPLS VPN/6VPE
- Cisco Intelligent Services Gateway (ISG)
- Inline Video Monitoring (VidMon)

Cisco 7600 ES Plus Advanced IP License

The Advanced IP license entitles you to use the Cisco IOS Software Release 12.2SR or Release 15S functions on the ES Plus line cards with the following functions in addition to the Basic license:

- 6VPE
- Layer 3 IP/MPLS VPN
- MVPN
- One Advanced IP license is needed for each of the ES Plus line cards in the system where these features are enabled

The Advanced IP license does not entitle you to use features contained in the Optical Transport Network, Intelligent Services Gateway, or Video Services Licenses on the Cisco 7600 ES Plus line cards.

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Cisco 7600 ES Plus Intelligent Services Gateway License

The Intelligent Services Gateway license (part number 76-ES+ISG-LIC) entitles use of the BNG features of Cisco IOS Software Release 12.2SR or Release 15S on the Cisco 7600 ES Plus line cards.

- The license is purchased per chassis in increments of 8000 subscribers requiring BNG features with 8 MPLS VPNs per license

Cisco 7600 Series ES Plus Video Monitoring License

The ES Plus Video Monitoring license (part number 76-ES+VIDEO-LIC) is available for purchase when the Video Monitoring capability is to be used, and is required on each chassis where Video Monitoring will be performed.

Interface Module Support

Table 4 lists the interface modules supported.

Table 5. ES Plus Line Card XFP and SFP Modules Supported

Part Number for ES Plus line cards 10-Gbps Small Form-Factor Pluggable (XFP)	Wavelength	Mode	Distance
XFP-10GZR-OC192LR, LAN-PHY	1550 nm	Single mode (SM)	49.7 miles (80 km)
XFP-10GER-OC192IR+, LAN-PHY	1550 nm	SM	24.8 miles (40 km)
XFP-10GLR-OC192SR, LAN-PHY	1310 nm	SM	6.2 miles (10 km)
SFP-GE-S	850 nm	Multimode (MM)	1804 ft (550m)
SFP-GE-L	1310 nm	SM	6.2 miles (10 km)
SFP-GE-Z	1550 nm	SM	43.5 miles (70 km)
SFP-GE-T	-	-	328 ft (100m)

Tables 5 through 9 give ordering information for the modules and line cards.

Table 6. Ordering Information for Cisco ES Plus line cards GE Gigabit Interface Converter (GLC) Modules

Product Number	Description
GLC-BX-D	1000BASE-BX10 SFP module for single-strand SMF, 1490-nm TX/1310-nm RX wavelength
GLC-BX-U	1000BASE-BX10 SFP module for single-strand SMF, 1310-nm TX/1490-nm RX wavelength

Table 7. Ordering Information for Cisco ES Plus line cards 10 GE Dense Wavelength - Division Multiplexing (DWDM) XFP Modules
Note: The following DWDM XFP products are orderable as spares only.

Product Number	Description	ITU Channel
DWDM-XFP-60.61=	10GBASE-DWDM 1560.61 nm XFP (100-GHz ITU grid)	21
DWDM-XFP-59.79=	10GBASE-DWDM 1559.79 nm XFP (100-GHz ITU grid)	22
DWDM-XFP-58.98=	10GBASE-DWDM 1558.98 nm XFP (100-GHz ITU grid)	23
DWDM-XFP-58.17=	10GBASE-DWDM 1558.17 nm XFP (100-GHz ITU grid)	24
DWDM-XFP-56.55=	10GBASE-DWDM 1556.55 nm XFP (100-GHz ITU grid)	26
DWDM-XFP-55.75=	10GBASE-DWDM 1555.75 nm XFP (100-GHz ITU grid)	27
DWDM-XFP-54.94=	10GBASE-DWDM 1554.94 nm XFP (100-GHz ITU grid)	28
DWDM-XFP-54.13=	10GBASE-DWDM 1554.13 nm XFP (100-GHz ITU grid)	29
DWDM-XFP-52.52=	10GBASE-DWDM 1552.52 nm XFP (100-GHz ITU grid)	31
DWDM-XFP-51.72=	10GBASE-DWDM 1551.72 nm XFP (100-GHz ITU grid)	32
DWDM-XFP-50.92=	10GBASE-DWDM 1550.92 nm XFP (100-GHz ITU grid)	33
DWDM-XFP-50.12=	10GBASE-DWDM 1550.12 nm XFP (100-GHz ITU grid)	34
DWDM-XFP-48.51=	10GBASE-DWDM 1548.51 nm XFP (100-GHz ITU grid)	36
DWDM-XFP-47.72=	10GBASE-DWDM 1547.72 nm XFP (100-GHz ITU grid)	37

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Product Number	Description	ITU Channel
DWDM-XFP-46.92=	10GBASE-DWDM 1546.92 nm XFP (100-GHz ITU grid)	38
DWDM-XFP-46.12=	10GBASE-DWDM 1546.12 nm XFP (100-GHz ITU grid)	39
DWDM-XFP-44.53=	10GBASE-DWDM 1544.53 nm XFP (100-GHz ITU grid)	41
DWDM-XFP-43.73=	10GBASE-DWDM 1543.73 nm XFP (100-GHz ITU grid)	42
DWDM-XFP-42.94=	10GBASE-DWDM 1542.94 nm XFP (100-GHz ITU grid)	43
DWDM-XFP-42.14=	10GBASE-DWDM 1542.14 nm XFP (100-GHz ITU grid)	44
DWDM-XFP-40.56=	10GBASE-DWDM 1540.56 nm XFP (100-GHz ITU grid)	46
DWDM-XFP-39.77=	10GBASE-DWDM 1539.77 nm XFP (100-GHz ITU grid)	47
DWDM-XFP-38.98=	10GBASE-DWDM 1538.98 nm XFP (100-GHz ITU grid)	48
DWDM-XFP-38.19=	10GBASE-DWDM 1538.19 nm XFP (100-GHz ITU grid)	49
DWDM-XFP-36.61=	10GBASE-DWDM 1536.61 nm XFP (100-GHz ITU grid)	51
DWDM-XFP-35.82=	10GBASE-DWDM 1535.82 nm XFP (100-GHz ITU grid)	52
DWDM-XFP-35.04=	10GBASE-DWDM 1535.04 nm XFP (100-GHz ITU grid)	53
DWDM-XFP-34.25=	10GBASE-DWDM 1534.25 nm XFP (100-GHz ITU grid)	54
DWDM-XFP-32.68=	10GBASE-DWDM 1532.68 nm XFP (100-GHz ITU grid)	56
DWDM-XFP-31.90=	10GBASE-DWDM 1531.90 nm XFP (100-GHz ITU grid)	57
DWDM-XFP-31.12=	10GBASE-DWDM 1531.12 nm XFP (100-GHz ITU grid)	58
DWDM-XFP-30.33=	10GBASE-DWDM 1530.33 nm XFP (100-GHz ITU grid)	59

Table 8. Cisco ES Plus line cards GE DWDM SFP Modules
Note: The following DWDM SFP products are orderable as spares only.

Product Number	Description	ITU Channel
DWDM-SFP-6141=	1000BASE-DWDM 1561.42 nm SFP (100-GHz ITU grid)	20
DWDM-SFP-6061=	1000BASE-DWDM 1560.61 nm SFP (100-GHz ITU grid)	21
DWDM-SFP-5979=	1000BASE-DWDM 1559.79 nm SFP (100-GHz ITU grid)	22
DWDM-SFP-5898=	1000BASE-DWDM 1558.98 nm SFP (100-GHz ITU grid)	23
DWDM-SFP-5817=	1000BASE-DWDM 1558.17 nm SFP (100-GHz ITU grid)	24
DWDM-SFP-5736=	1000BASE-DWDM 1557.36 nm SFP (100-GHz ITU grid)	25
DWDM-SFP-5655=	1000BASE-DWDM 1556.55 nm SFP (100-GHz ITU grid)	26
DWDM-SFP-5575=	1000BASE-DWDM 1555.75 nm SFP (100-GHz ITU grid)	27
DWDM-SFP-5494=	1000BASE-DWDM 1554.94 nm SFP (100-GHz ITU grid)	28
DWDM-SFP-5413=	1000BASE-DWDM 1554.13 nm SFP (100-GHz ITU grid)	29
DWDM-SFP-5332=	1000BASE-DWDM 1553.33 nm SFP (100-GHz ITU grid)	30
DWDM-SFP-5252=	1000BASE-DWDM 1552.52 nm SFP (100-GHz ITU grid)	31
DWDM-SFP-5172=	1000BASE-DWDM 1551.72 nm SFP (100-GHz ITU grid)	32
DWDM-SFP-5092=	1000BASE-DWDM 1550.92 nm SFP (100-GHz ITU grid)	33
DWDM-SFP-5012=	1000BASE-DWDM 1550.12 nm SFP (100-GHz ITU grid)	34
DWDM-SFP-4931=	1000BASE-DWDM 1549.32 nm SFP (100-GHz ITU grid)	35
DWDM-SFP-4851=	1000BASE-DWDM 1548.51 nm SFP (100-GHz ITU grid)	36
DWDM-SFP-4772=	1000BASE-DWDM 1547.72 nm SFP (100-GHz ITU grid)	37
DWDM-SFP-4692=	1000BASE-DWDM 1546.92 nm SFP (100-GHz ITU grid)	38
DWDM-SFP-4612=	1000BASE-DWDM 1546.12 nm SFP (100-GHz ITU grid)	39
DWDM-SFP-4532=	1000BASE-DWDM 1545.32 nm SFP (100-GHz ITU grid)	40
DWDM-SFP-4453=	1000BASE-DWDM 1544.53 nm SFP (100-GHz ITU grid)	41
DWDM-SFP-4373=	1000BASE-DWDM 1543.73 nm SFP (100-GHz ITU grid)	42
DWDM-SFP-4294=	1000BASE-DWDM 1542.94 nm SFP (100-GHz ITU grid)	43

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Product Number	Description	ITU Channel
DWDM-SFP-4214=	1000BASE-DWDM 1542.14 nm SFP (100-GHz ITU grid)	44
DWDM-SFP-4134=	1000BASE-DWDM 1541.35 nm SFP (100-GHz ITU grid)	45
DWDM-SFP-4056=	1000BASE-DWDM 1540.56 nm SFP (100-GHz ITU grid)	46
DWDM-SFP-3977=	1000BASE-DWDM 1539.77 nm SFP (100-GHz ITU grid)	47
DWDM-SFP-3898=	1000BASE-DWDM 1538.98 nm SFP (100-GHz ITU grid)	48
DWDM-SFP-3819=	1000BASE-DWDM 1538.19 nm SFP (100-GHz ITU grid)	49
DWDM-SFP-3739=	1000BASE-DWDM 1537.40 nm SFP (100-GHz ITU grid)	50
DWDM-SFP-3661=	1000BASE-DWDM 1536.61 nm SFP (100-GHz ITU grid)	51
DWDM-SFP-3582=	1000BASE-DWDM 1535.82 nm SFP (100-GHz ITU grid)	52
DWDM-SFP-3504=	1000BASE-DWDM 1535.04 nm SFP (100-GHz ITU grid)	53
DWDM-SFP-3425=	1000BASE-DWDM 1534.25 nm SFP (100-GHz ITU grid)	54
DWDM-SFP-3346=	1000BASE-DWDM 1533.47 nm SFP (100-GHz ITU grid)	55
DWDM-SFP-3268=	1000BASE-DWDM 1532.68 nm SFP (100-GHz ITU grid)	56
DWDM-SFP-3190=	1000BASE-DWDM 1531.90 nm SFP (100-GHz ITU grid)	57
DWDM-SFP-3112=	1000BASE-DWDM 1531.12 nm SFP (100-GHz ITU grid)	58
DWDM-SFP-3033=	1000BASE-DWDM 1530.33 nm SFP (100-GHz ITU grid)	59

Table 9. Cisco ES Plus line cards GE CWDM SFP Modules
Note: The following CWDM SFP products are orderable as spares only.

Product Number	Description	Color
CWDM-SFP-1470=	Cisco CWDM 1470-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fiber Channel	Gray
CWDM-SFP-1490=	Cisco CWDM 1490-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fiber Channel	Violet
CWDM-SFP-1510=	Cisco CWDM 1510-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fiber Channel	Blue
CWDM-SFP-1530=	Cisco CWDM 1530-nm SFP; Gigabit Ethernet and 1 and 2-Gb Fiber Channel	Green
CWDM-SFP-1550=	Cisco CWDM 1550-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fiber Channel	Yellow
CWDM-SFP-1570=	Cisco CWDM 1570-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fiber Channel	Orange
CWDM-SFP-1590=	Cisco CWDM 1590-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fiber Channel	Red
CWDM-SFP-1610=	Cisco CWDM 1610-nm SFP; Gigabit Ethernet and 1 and 2 Gb Fiber Channel	Brown

Ordering Information

Table 10. Ordering Information for Cisco 7600 Series Ethernet Services Plus line cards

Product Name	Part Number
Cisco 7600 Series Ethernet Services Plus 20G Line Card, 2-port 10 GE XFP and DFC-3C	7600-ES+2TG3C
Cisco 7600 Series Ethernet Services Plus 20G Line Card, 2-port 10 GE XFP and DFC-3CXL	7600-ES+2TG3CXL
Cisco 7600 Series Ethernet Services Plus 20G Line Card, 20-port GE SFP and DFC-3C	7600-ES+20G3C
Cisco 7600 Series Ethernet Services Plus 20G Line Card, 20-port GE SFP and DFC-3CXL	7600-ES+20G3CXL
Cisco 7600 Series Ethernet Services Plus 40G Line Card, 4-port 10 GE XFP and DFC-3C	7600-ES+4TG3C
Cisco 7600 Series Ethernet Services Plus 40G Line Card, 4-port 10 GE XFP and DFC-3CXL	7600-ES+4TG3CXL
Cisco 7600 Series Ethernet Services Plus 40G Line Card, 40-port GE SFP and DFC-3C	7600-ES+40G3C
Cisco 7600 Series Ethernet Services Plus 40G Line Card, 40-port GE SFP and DFC-3CXL	7600-ES+40G3CXL
Cisco 7600 Series Ethernet Services Plus Basic License	76-ES+BASIC-LIC
Cisco 7600 Series Ethernet Services Plus Advanced License	76-ES+ADVIP-LIC
Cisco 7600 Series Ethernet Services + Intelligent Services Gateway License	76-ES+ISG-LIC
Cisco 7600 Series Ethernet Services Plus Video Monitoring License	76-ES+VIDEO-LIC

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Visit the Cisco Software Center to download Cisco IOS Software Release 12.2(33)SRD (or later) used with Supervisor Engine 720 or Route Switch Processor 720.

Service and Support

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